

**Title: Get the Message****Brief Overview:**

This learning unit involves collecting, organizing, interpreting, analyzing, and displaying data. Students will utilize the collected data to analyze a real-life dilemma. The students will demonstrate the basic concepts of probability.

**Links to Standards:**

- **Mathematics as Problem Solving**  
Students will demonstrate their ability to solve problems in mathematics including problems with open-ended answers, problems which are solved in a cooperative atmosphere, and problems which are solved with the use of technology.
- **Mathematics as Communication**  
Students will demonstrate their ability to communicate mathematically. They will read, write, and discuss mathematics with language and the signs, symbols, and terms of the discipline.
- **Mathematics as Reasoning**  
Students will demonstrate their ability to reason mathematically. They will make conjectures, gather evidence, and build arguments.
- **Mathematical Connections**  
Students will demonstrate their ability to connect mathematics topics with the discipline and with other disciplines.
- **Number and Number Relationships**  
Students will demonstrate their ability to describe and apply number relationships using concrete and abstract materials.
- **Concepts of Whole Number Operations**  
Students will choose appropriate operations and describe effects of operations on numbers.
- **Statistics**  
Students will demonstrate their ability to collect, organize, and display data and will interpret information obtained from displays. They will write reports based on statistical information.
- **Probability**  
Students will demonstrate the basic concepts of probability such as predicting and finding probabilities.

**Grade/Level:**

Grades 4-5

**Duration:**

This unit will take approximately 4-5 class periods (50 minutes each).

## **Prerequisite Knowledge:**

Students should have working knowledge of the following:

- predicting
- graphing
- comparing/contrasting
- number sense
- probability

## **Objectives:**

Students will:

- collect, organize, interpret, analyze, and display data.
- work cooperatively in pairs/groups.
- identify solutions to a real-life dilemma.
- compare/contrast data.

## **Materials/Resources/Printed Materials:**

- When I Was Little, by Toyomi Igus
- The World Almanac and Book of Facts 1997 by Almanac Books
- Student Resource Sheets
- Teacher Resource (Rubric)
- Graph Paper
- Construction Paper
- Glue
- Scissors
- Calculator
- Dice
- Telephone Directory
- Mall Directory Resource Sheet
- Magazine Pictures: computer, pager, and telephone
- Post-Its
- Student Journal

## **Development/Procedures:**

### **Day 1:**

- Read the book When I Was Little, by Toyomi Igus. Discuss the types of technology in the two eras. Discuss the various types of communications that we use to keep in touch with each other.
- Have students work in groups of 4-6 to plot data concerning US households with cable television, and US households that have computer owners from 1983 to 1996 (use only the years 1983, 1986, 1989, 1991, 1994 and 1996). Each group will design their own graph. Each group will share their information with the class.
- Have students work in groups of 4-6 predicting how many phones, computers and pagers there are in the household of a typical fourth (fifth) grade student of today.

- Have students complete student resource sheet #1 (Home Survey) for home assignment.

### **Day 2:**

- Display a picture of a computer, pager, and telephone.
- Give students three post-its.
- Have each student write the number of computers, pagers and telephones from the home survey (student resource sheet #1) under the appropriate picture.
- Students will display the collected data using a line plot. (There should be three line plots).
- Facilitate questions about finding the median / mean for each line plot.
- Have students compare / contrast the survey data with their predictions.
- Have students compare / contrast home survey data to data from The World Almanac.
- Have students write a journal response to question: **If a new fourth (fifth) grade student were to walk into the classroom right now, how many computers, pagers, and telephones do you think he/she would have in their household?** (See student response sheet #2)

### **Day 3:**

- Have students work in groups to come up with ways to put all information (computers, pagers, telephones) into a compact and concise graph.
- Facilitate among groups.
- Have groups share and discuss their methods.
- Introduce the glyph ( student resource sheet #3)
- Have students work individually completing glyph.
- Have students display glyphs at the front of the classroom. Use the information from one student's glyph to describe the personal data represented on the glyph: students in the class will try to identify the student you are describing by interpreting the data on the glyph. They can use the process of elimination.
- Facilitate questions that have the students guessing which glyph you are talking about.

### **Day 4:**

- Students will complete student resource #4.

### **Performance Assessment:**

See student resource sheet #4.

**Extension/Follow Up:**

This unit can be used across the curriculum in Social Studies, Whole Language, and Science for the fourth and fifth grades.

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# Get the Message

Record the number of computers, telephones, and pagers in your household.

TECHNOLOGY	TALLY	TOTAL
<div>COMPUTERS</div>		
<div>TELEPHONES</div>		
<div>PAGERS</div>		

# WRITING TO INFORM

Write a journal response to the following question. Make sure you use facts from your activity to justify your response.

"If a new fourth grade student were to enter this classroom today, predict how many telephones, computers, and pagers do you think he/she would have in their household? WHY?"

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## GET THE MESSAGE

## YOU MAKE THE CALL

## GLYPH

## SURVEY QUESTIONS:





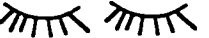







Who has a pager in your home? \_\_\_\_\_

How many telephones are in your home? \_\_\_\_\_

How many hours per day do you spend on the computer? \_\_\_\_\_

Do your parents have a car phone? \_\_\_\_\_

## GLYPH KEY

FEATURE	SHOWS	SYMBOLS
EYES	FAMILY MEMBER WITH A PAGER	MOTHER  FATHER  MOTHER & FATHER  YOU  NO ONE 
NOSE	HOURS PER DAY ON THE COMPUTER	0 - 1  2 - 4  5 OR MORE 
EARS	NUMBER OF TELEPHONES	1 - 3  4 OR MORE 
MOUTH	CAR PHONE	YES  NO 

## Vignette for Performance Assessment

### Vignette

You are expecting a page from your best friend telling you to meet him/her at a specific store in the mall. When the number appears on your pager, you find that the last digit has faded. You immediately begin to try to determine the correct number. In the meantime, you find that you only have two quarters left to make this very important call. **How would you find the digit that is most likely to appear in the number?**

**Write a paragraph explaining how you arrived at your answer. Include the materials you used and a description of your activity. Graph your data to further explain your answer.**



## **MALL DIRECTORY**

### **FIRST LEVEL STORES**

<b>SEARS</b>	<b>555-0001</b>
<b>MACY'S</b>	<b>555-1112</b>
<b>HECHT'S</b>	<b>555-2223</b>
<b>THE GREAT COOKIE</b>	<b>555-3334</b>
<b>RITE-AID</b>	<b>555-4445</b>
<b>PRE SCHOOL SUPPLY STORE</b>	<b>555-5556</b>
<b>CACHE'</b>	<b>555-6667</b>
<b>ELEGANTLY YOURS</b>	<b>555-7778</b>
<b>HAIR CUTTERY</b>	<b>555-8889</b>

### **SECOND LEVEL STORES**

<b>BIG AND TALL</b>	<b>555-0123</b>
<b>BGE</b>	<b>555-1234</b>
<b>GAP</b>	<b>555-2345</b>
<b>THE LIMITED</b>	<b>555-3456</b>
<b>MERRY-GO- ROUND</b>	<b>555-4567</b>
<b>MACDONALD'S EXPRESS</b>	<b>555-5678</b>
<b>CINNABON</b>	<b>555-6789</b>
<b>THE WHITE HOUSE</b>	<b>555-7890</b>
<b>WALDEN BOOKSTORE</b>	<b>555-0321</b>

## **SCORING RUBRIC**

(Performance Assessment)

<b>SCORE</b>	<b>CRITERIA</b>
4	Showed thinking with an illustration, number sentence, etc. Used mathematical terms. Used complete sentences to explain thinking. Solved the problem correctly and gave extra information. Used problem solving strategies.
3	Showed thinking with an illustration, number sentence, etc. Used mathematical terms. Used complete sentences to explain thinking. Solved problem correctly.
2	Showed thinking but had some mistakes. Did not explain thinking using mathematical terms.
1	Did not address the given problem.